

What is claimed is:

1. A different materials bonded member, comprising:
 - a metallic member
 - a ceramic base having a bonding surface including one of an active metal layer and a metalized layer on a portion thereof, said one of said active metal layer and said metalized layer comprising a metal which is active with respect to a ceramic constituting said ceramic base;
 - a solder material comprising Au interposed between said ceramic base and said metallic member; and
 - a barrier layer interposed between said ceramic base and said metallic member, said barrier layer comprising a material which protects against or suppresses the diffusion of a metal constituting said metallic member into said solder material, wherein
 - said ceramic base and said metallic member are bonded to one another via said solder material which is disposed on said bonding surface of said ceramic base and is heated and melted to form a pre-coat layer adhering to said bonding surface, said metallic member is disposed on a surface of said pre-coat layer and a bonded part is formed by solidifying said pre-coat layer after said pre-coat layer is heated and melted at a temperature between

1070 and 1150°C to bond said ceramic base and said metallic member to one another.

2. A different materials bonded member, comprising:
a metallic member;
a ceramic base having a bonding surface;
a solder material comprising Au interposed between said ceramic base and said metallic member, and including a metal which is active to a ceramic constituting said ceramic base; and

a barrier layer interposed between said ceramic base and said metallic member, said barrier layer comprising a material which protects against or suppresses the diffusion of a metal constituting said metallic member into said solder material, wherein

said ceramic base and said metallic member are bonded to one another via said solder material which is disposed on said bonding surface and is heated and melted to form a pre-coat layer adhering to said bonding surface, said metallic member is disposed on a surface of said pre-coat layer and a bonded part is formed by solidifying said pre-coat layer after said pre-coat layer is heated and melted at a temperature between 1070 and

1150°C to bond said ceramic base and said metallic member to one another.

3. A different materials bonded member according to claims 1 or 2, wherein the barrier layer is formed by plating the metallic member.

4. A different materials bonded member according to claims 1 or 2, wherein said barrier layer is bonded to said metallic member beforehand via a solder material having a melting point that is higher than 1150°C.

5. A different materials bonded member according to claims 1 or 2, wherein a thickness of said pre-coat layer is at least 20 μm .

6. A different materials bonded member, comprising:
a metallic member;
a ceramic base having a bonding surface;
one of an active metal layer and a metalized layer disposed on said bonding surface of said ceramic base, said one of said active metal layer and said metalized layer comprising a metal which is active to a ceramic constituting said ceramic base;

a solder material interposed between said metallic member and said ceramic base, and disposed on said one of said active metal layer and said metalized layer, said solder material comprising Au; and

a barrier layer interposed between said solder material and said metallic member, said barrier layer comprising a material which protects against or suppresses the diffusion of a metal component constituting said metallic member into said solder material, wherein

said ceramic base and said metallic member are bonded to one another via said solder material and a bonded part is formed by solidifying said solder material after said solder material is heated and melted at a temperature between 1070 and 1150°C to bond said ceramic base and said metallic member to one another.

7. A different materials bonded member according to claims 1, 2 or 6, wherein the hardness of the bonded part is at most $Hv_{0.1}100$.

8. A different materials bonded member according to claim 1, 2 or 6, wherein the barrier layer comprises Cr.

9. A different materials bonded member according to claims 1, 2 or 6, wherein the metallic member comprises at least one material selected from the group consisting of Ni, Co, Fe and Cr.

10. A different materials bonded member according to claims 1, 2 or 6, wherein the bonded member includes a chamber for producing a semiconductor therein.

11. A different materials bonded member according to claim 10, wherein the ceramic base is a susceptor for disposing a semiconductor wafer on a surface thereon and the metallic member is a corrosion-resisting ring for furnishing the chamber for producing a semiconductor with the susceptor.

12. A different materials bonded member according to claim 10, wherein the bonded part is exposed to inert and oxidizing atmospheres outside of the semiconductor manufacturing chamber and is exposed to an atmosphere inside of the semiconductor manufacturing chamber having a pressure that is lower than the pressure of the atmosphere outside of the semiconductor manufacturing chamber.

13. A different materials bonded member according to claims 1, 2 or 6, further comprising a conductive material including at least one of Mo and W or an alloy thereof embedded in the ceramic base with a portion of the surface of the conductive material being exposed from the ceramic base, and the bonded part is formed so as to cover the portion of the surface of the conductive material to bond the ceramic base and the metallic member.

14. A different materials bonded member according to claim 13, wherein the metallic member is a terminal feeding to the conductive material and the bonded part is exposed to an atmosphere outside of the semiconductor manufacturing chamber.

15. A different materials bonded member according to claims 1, 2 or 6, wherein the bonded member comprises a susceptor for mounting a semiconductor wafer and can function as any one of a heater and an electrostatic chuck, and both a heater and an electrostatic chuck.

16. A different materials bonded member, comprising:
a metallic member comprising one of Cr and an alloy composed essentially of Cr;

a ceramic base having a bonding surface including one of an active metal layer and a metalized layer on a portion thereof, said one of said active metal layer and said metalized layer comprising a metal which is active with respect to a ceramic constituting said ceramic base; and

a solder material comprising Au interposed between said metallic member and said ceramic base, wherein

said ceramic base and said metallic member are bonded to one another via said solder material which is disposed on said bonding surface of said ceramic base and is heated and melted to form a pre-coat layer adhering to said bonding surface, said metallic member is disposed on a surface of said pre-coat layer and a bonded part is formed by solidifying said pre-coat layer after said pre-coat layer is heated and melted at a temperature between 1070 and 1150°C to bond the ceramic base and the metallic member to one another.

17. A different materials bonded member, comprising:

a metallic member comprising one of Cr and an alloy composed essentially of Cr;

a ceramic base having a bonding surface including one of an active metal layer and a metalized layer on a

portion thereof, said one of said active metal layer and said metalized layer comprising a metal which is active with respect to a ceramic constituting said ceramic base; and

a solder material comprising Au interposed between said metallic member and said ceramic base, and including a metal which is active to a ceramic constituting said ceramic base, wherein

said ceramic base and said metallic member are bonded to one another via said solder material which is disposed on said bonding surface of said ceramic base and is heated and melted to form a pre-coat layer adhering to said bonding surface, said metallic member is disposed on a surface of said pre-coat layer, and a bonded part is formed by solidifying said pre-coat layer after said pre-coat layer is heated and melted at a temperature between 1070 and 1150°C to bond the ceramic base and the metallic member to one another.

18. A method for producing a different materials bonded member comprising a ceramic base and a metallic member bonded to one another via a solder material comprising Au, the method comprising the steps of:

disposing the solder material on a bonding surface of the ceramic base including one of an active metal layer and metalized layer comprising a metal which is active to a ceramic constituting the ceramic base;

heating and melting the solder material to form a pre-coat layer adhering to the bonding surface of the ceramic base;

disposing the metallic member on a surface of the pre-coat layer, with a barrier layer interposed between the metallic member and the ceramic base, said barrier layer comprising a material which protects against or suppresses the diffusion of a metal constituting the metallic member into the solder material;

heating and melting the pre-coat layer at a temperature between 1070 and 1150°C.; and

forming a bonded part by solidifying the pre-coat layer to bond the ceramic base and the metallic member to one another.

19. A method for producing a different materials bonded member comprising a ceramic base and a metallic member bonded to one another via a solder material comprising Au, the method comprising the steps of:

disposing the solder material on a bonding surface of the ceramic base, said solder material comprises a metal which is active to a ceramic comprising the ceramic base;

heating and melting the solder material to form a pre-coat layer adhering to the bonding surface of the ceramic base;

disposing the metallic member on a surface of the pre-coat layer, with a barrier layer interposed between the metallic member and the ceramic base, the barrier layer comprising a material which protects against or suppresses the diffusion of a metal comprising the metallic member into the solder material;

heating and melting the pre-coat layer at a temperature between 1070 and 1150°C.; and

forming a bonded part by solidifying the pre-coat layer to bond the ceramic base and the metallic member to one another.

20. The method according to claim 19, wherein the solder material is a mixture of Au powder and a powder of said metal which is active to the ceramic comprising the ceramic base.

21. The method according to claims 18 or 19, wherein the barrier layer is formed by plating the metallic member.

22. The method according to claims 18 or 19, wherein the barrier layer is bonded to the metallic member beforehand with a solder material having a melting point that is higher than 1150°C.

23. The method according to claims 18 or 19, wherein the thickness of the pre-coat layer is at least 20 μm .

24. A method for producing a different materials bonded member comprising a ceramic base and a metallic member bonded to one another via a solder material comprising Au, the method comprising the steps of:

disposing in turn on a bonding surface of the ceramic base (i) one of an active metal layer and a metalized layer comprising a metal which is active to a ceramic constituting the ceramic base, (ii) the solder material, (iii) a barrier layer comprising a material which protects against or suppresses the diffusion of a metal component constituting the metallic member into the solder material as an inner layer, and (iv) the metallic member;

heating and melting the solder material at a temperature between 1070 and 1150°C.; and

forming a bonded part by solidifying the solder material to bond the ceramic base and the metallic member to one another.

25. The method according to claims 18, 19 or 24, wherein the hardness of the bonded part is at most $Hv_{0.1}100$.

26. The method according to claims 18, 19 or 24, wherein the barrier layer comprises Cr.

27. The method according to claims 18, 19 or 24, further comprising a conductive material including one of Mo and W or an alloy thereof embedded in the ceramic base with a portion of the surface of the conductive material being exposed from the ceramic base, and the bonded part is formed so as to cover the portion of the surface of the conductive material to bond the ceramic base and the metallic member.

28. A method for producing a different materials bonded member comprising a ceramic base and a metallic member

bonded to one another via a solder material comprising Au, the method comprising the steps of:

disposing the solder material on a bonding surface of the ceramic base including one of an active metal layer and metalized layer comprising a metal which is active to a ceramic constituting the ceramic base;

heating and melting the solder material to form a pre-coat layer adhering to the bonding surface;

disposing the metallic member comprising one of Cr and an alloy composed essentially of Cr on a surface of the pre-coat layer;

heating and melting the pre-coat layer at a temperature between 1070 and 1150°C.; and

forming a bonded part by solidifying the pre-coat layer to bond the ceramic base and the metallic member to one another.

29. A method for producing a different materials bonded member comprising a ceramic base and a metallic member bonded to one another via a solder material comprising Au, the method comprising the steps of:

disposing the solder material on a bonding surface of the ceramic base, the solder material comprises a

metal which is active to a ceramic constituting the ceramic base;

heating and melting the solder material to form a pre-coat layer adhering to the bonding surface;

disposing the metallic member comprising one of Cr and an alloy composed essentially of Cr on a surface of the pre-coat layer;

heating and melting the pre-coat layer at a temperature between 1070 and 1150°C.; and

forming a bonded part by solidifying the pre-coat layer to bond the ceramic base and the metallic member to one another.

30. The method according to claim 29, wherein the solder material is a mixture of Au powder and a powder of said metal which is active to a ceramic constituting the ceramic base.

31. A method for producing a different materials bonded member comprising a ceramic base and a metallic member bonded to one another via a solder material comprising Au, the method comprising the steps of:

disposing in turn on a bonding surface of the ceramic base (i) one of an active metal layer and a

metalized layer comprising a metal which is active to a ceramic constituting the ceramic base, (ii) the solder material, and (iii) the metallic member comprising one of Cr and an alloy composed essentially of Cr;

heating and melting the solder material at a temperature between 1070 and 1150°C; and

forming a bonded part by solidifying the solder material to bond the ceramic base and the metallic member to one another.

32. A method for producing a different materials bonded member comprising a ceramic base and a metallic member bonded to one another via a solder material comprising Au, the method comprising the steps of:

disposing in turn on a bonding surface of the ceramic base (i) one of an active metal layer and a metalized layer comprising a metal which is active to a ceramic constituting the ceramic base, (ii) the solder material comprising a metal which is active to the ceramic constituting the ceramic base, and (iii) the metallic member comprising one of Cr and an alloy composed essentially of Cr;

heating and melting the solder material at a temperature between 1070 and 1150°C.; and

forming a bonded part by solidifying the solder material to bond the ceramic base and the metallic member to one another.

33. The method according to claim 32, wherein the solder material is a mixture of Au powder and a powder of said metal which is active to the ceramic constituting the ceramic base.